

FY18 Epi-Tech Surveillance Training

Sunday, October 01, 2017 - Sunday, September 30, 2018
DCS, APG, MD

Provided By

U.S. Army Medical Command

<u>Activity ID</u>	<u>Course Director</u>	<u>CME Planner</u>
2017-1636	John Ambrose	Mimi C. Eng

Accreditation Statement

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of U.S. Army Medical Command and ARMY PUBLIC HEALTH CENTER. The U.S. Army Medical Command is accredited by the ACCME to provide continuing medical education for physicians.

Credit Designation

The U.S. Army Medical Command designates this Live Activity for a maximum of 5 *AMA PRA Category 1 Credit (s)*TM. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Statement of Need/Gap Analysis

The purpose of this CME activity is to address the identified gap(s):

1. Surveillance techniques - Surveillance of common communicable diseases continues to be a problem among local MTFs. In fact, cases of campylobacter were not investigated in 2015 for PACOM MTFS, while 2016 cases of salmonella were not investigated. Civilian public health agencies are required to conduct investigations into all reportable medical events. However, DoD facilities often do not take initiative to conduct this investigation.
2. Disease identification - verification of disease by established case definitions have been utilized by the local health departments, Centers for Disease Control and Prevention, World Health Organization, and the Department of Defense. With the every changing list of reportable medical events and new emerging infections, case definitions change rapidly. Army epidemiologist conduct verification studies that monitor the efficiency of reporting by local public health experts and have concluded that completeness percentages for reportable medical events range as low as 35% for select diseases.
3. Outbreak reporting - Recent evidence have demonstrated that outbreak reporting and communication between public health agencies is poor. In fact, the Army failed to report six outbreaks in the DRSi between June 2016 and September 2016.

Learning Objectives

1. Based on case presentation, enhance your ability to improve case finding and surveillance practices within your local MTF.

Target Audience / Scope of Practice

- Target Audience: The intended audience for this educational activity includes preventive medicine physicians, community health nurses, public health nurses, and epidemiology technicians.
- Scope of Practice: This activity will improve the performance of preventive medicine personnel who conduct surveillance activities in inpatient and outpatient settings.

Disclosure of Faculty/Committee Member Relationships

It is the policy of the U.S. Army Medical Command that all CME planning committee/faculty/authors disclose relationships with commercial entities upon invitation of participation. Disclosure documents are reviewed for potential conflicts of interest and, if identified, they are resolved prior to confirmation of participation.

Faculty Members

- | | |
|--------------------|-------------------------------|
| Brown, Alfonza | - No information to disclose. |
| Gibson, Kelly | - No information to disclose. |
| Holbrook, Victoria | - No information to disclose. |
| Kebisek, Julianna | - No information to disclose. |
| Reynolds, Mark | - No information to disclose. |
| Reynolds, Mark | - No information to disclose. |
| Riegodedios, Asha | - No information to disclose. |
| Walters, Cedric | - No information to disclose. |

Committee Members

- | | |
|-------------------|-------------------------------|
| Ambrose, John | - No information to disclose. |
| Eng, Mimi | - No information to disclose. |
| Gibson, Kelly | - No information to disclose. |
| Riegodedios, Asha | - No information to disclose. |

Acknowledgement of Commercial Support

There is no commercial support associated with this educational activity.

- To Register for the Monthly Disease Surveillance Trainings:
 1. Contact your Service Surveillance HUB to receive monthly updates and reminders
 2. Log-on or Request log-on ID/password:
<https://tiny.army.mil/r/zB8A/CME>
 3. Register at: <https://tiny.army.mil/r/MEHsS/EpiTechFY18>

- Confirm attendance:
 - Please enter your full name/email into the DCS chat box to the right or email your Service hub
 - You will receive a confirmation email within 48 hours with your attendance record; if you do not receive this email, please contact your Service hub

Heat Illness Reporting



U.S. ARMY PUBLIC HEALTH CENTER



COL Mark Reynolds
Clinical Public Health and Epidemiology

At the end of the presentation, the learner will be able to:

Describe the clinical spectrum of Heat Illness commonly encountered in a clinical setting to improve diagnosis and reporting of heat illness

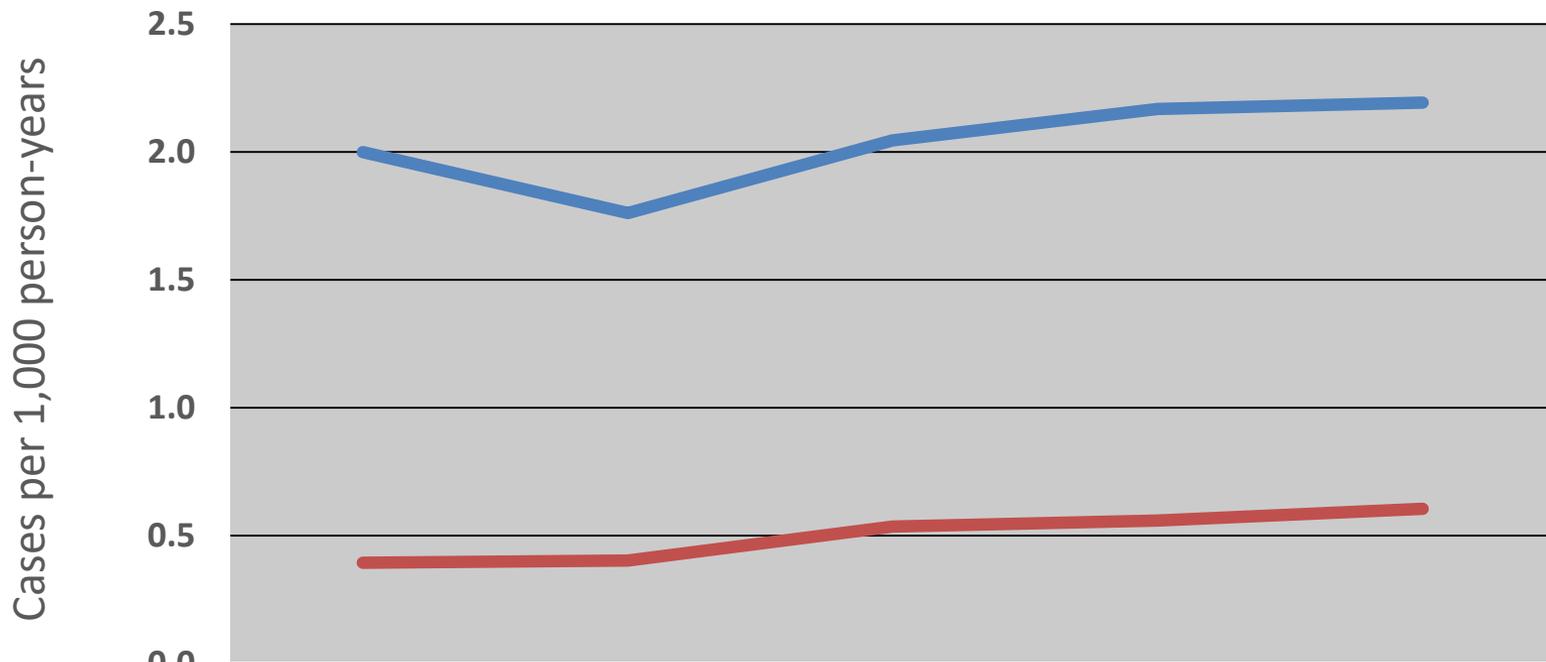
Identify key details necessary for accurate reporting of Heat Illness described in the 2017 Armed Forces Reportable Medical Events Guidelines and Case Definitions

Adhere to DoD heat illness reporting guidelines outlined in AR-40-11 as cases are encountered in the clinic

- A spectrum of disorders that occur when the body is unable to dissipate heat absorbed from the environment and/or heat generated by internal metabolic processes
- Direct operational and readiness impacts across the Army
- Complicated nature of Heat Illness (HI) reflected in clinical and surveillance definitions

1. Lugo-Amador NM, Rothenhaus T, Moyer P. Heat-related illness. *Emerg Med Clin N Am.* 2004;22(2):315–327.
2. Simon HB. Hyperthermia. *N Engl J Med.* 1993;329(7):483–487.

Heat Illness Army 2013-2017



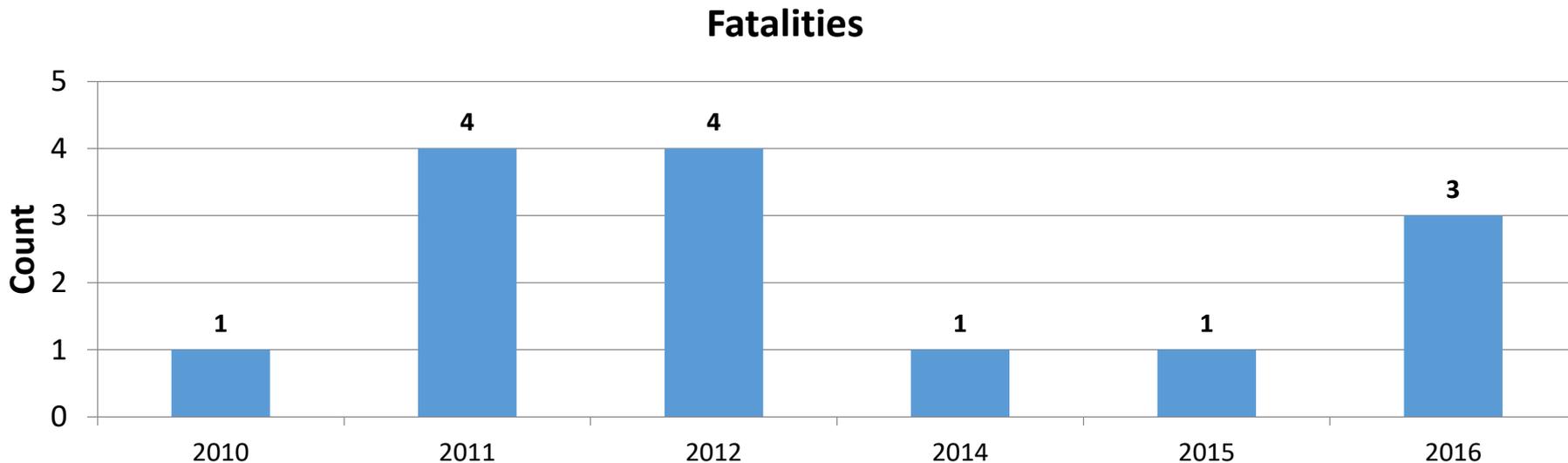
	2013	2014	2015	2016	2017
Heat exhaustion	2.00	1.76	2.04	2.17	2.19
Heat stroke	0.39	0.40	0.54	0.56	0.60

Diagnosis	1 week profile (7 days Limited or Lost Duty)	2 week profile (14 days Limited or Lost Duty)	3 week profile (21 days Limited or Lost Duty)	10 week profile (70 days Limited or Lost Duty)	18 week profile (126 days Limited or Lost Duty)
Heat Exhaustion (n=771)	5,397	10,794	16,191	NA	NA
Heat Injury* (n=?)	?	?	?	?	?
Heat Stroke (n=183)	NA	NA	NA	12,810	23,058

*Heat injury was not an option in DRSi after 15 July 2017

Data Source: DRSi, AR 40-501

- Combat Readiness Center tracks fatalities under Class A Accidents
 - Property damage of \$2,000,000.00 or more
 - Army aircraft missing or destroyed
 - Injury or Occupational Illness resulting in fatality or permanent total disability
- Fourteen fatalities determined to be a result of Heat-Related Illness FY10-FY16
 - Case review pending to identify common characteristics and risk factors



Data Source: Combat Readiness Center

Average: 2.3/year Range 1-4

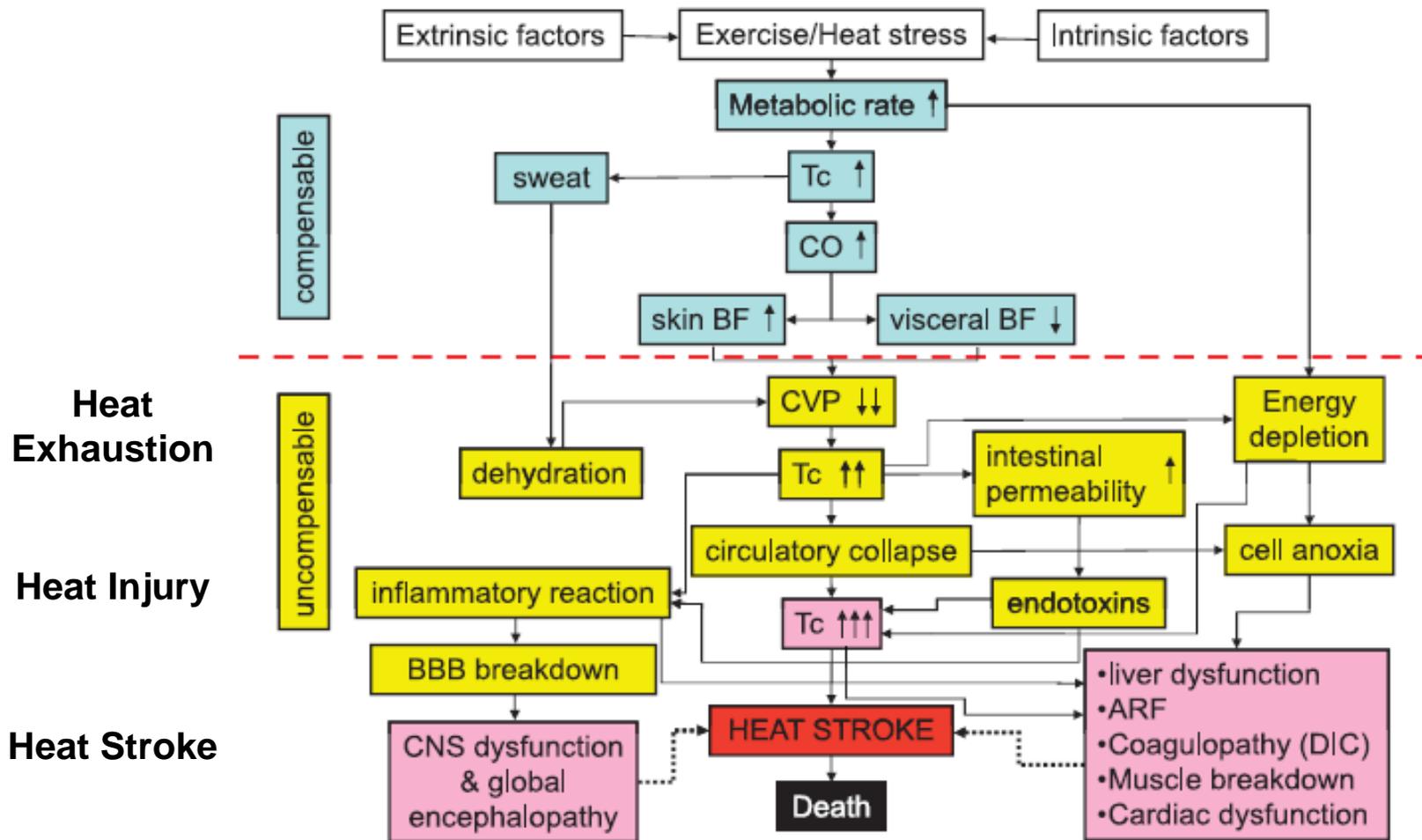
- **Heat Exhaustion (HE):** Syndrome of hyperthermia (core temperature at time of event usually $\leq 40^{\circ}\text{C}$ or 104°F) with physical collapse or debilitation occurring during or immediately following exertion in the heat, with *no more than minor* central nervous system (CNS) dysfunction (such as headache, dizziness)
- **Heat Injury (HI):** HE plus clinical evidence of organ (for example, liver, renal, stomach) and/or muscle (for example, rhabdomyolysis) damage without sufficient neurological symptoms to be diagnosed as heat stroke
- **Heat Stroke (HS):** Syndrome of hyperthermia (core temperature at time of event usually $\geq 40^{\circ}\text{C}$ or 104°F), physical collapse or debilitation, and encephalopathy as evidenced by delirium, stupor, or coma, occurring during or immediately following exertion or significant heat exposure. The HS can be complicated by organ and/or tissue damage, systemic inflammatory activation, and disseminated intravascular coagulation.

AR 40-501 Standards of Medical Fitness 14 June 2017

- Heat Balance Equation

$$S = M \pm W \pm (R + C) - E$$

- Rate of Body Heat Exchange {S} = rate of metabolic energy/heat production {M} + mechanical work {W} + (rate of radiant and convective energy exchange){R+C} – rate of evaporative loss {E}
- Combination of Extrinsic and Intrinsic risk factors
- Combination of Modifiable and non-modifiable
- Effect of determinants will vary by location, activity, and individual
- Known risk factors
 - Environmental Factors (external heat stress)
 - Training burden and type
 - Gender
 - Physical Fitness
 - Uniform
 - Body Composition
 - Acclimatization



From: Epstein Y, Roberts WO. The pathophysiology of heat stroke: an integrative view of the final common pathway. *Scandinavian Journal of Medicine & Science in Sports* 2011

2017 Armed Forces Reportable Medical Events Guidelines and Case Definitions

Heat Exhaustion Clinical Description:

- Heat exhaustion (HE) is defined as the inability to continue physical activity due to competing demand for cardiac output between thermoregulation and metabolic requirements. Clinically, HE may present as weakness, fatigue, ataxia, dizziness, headache, nausea, vomiting, malaise in individuals with a core body temperature less than 104°F or 40°C. HE may be accompanied by evidence of end organ damage (Hypo/hyperkalemia, Elevated AST or ALT, Elevated CK, Rhabdomyolysis/myoglobinuria). HE resolves rapidly with minimal cooling intervention.

2017 Armed Forces Reportable Medical Events Guidelines and Case Definitions

Heat Exhaustion Case Classification (Confirmed):

- A case that meets the clinical description of HE as described above occurring during/immediately after exertion or heat exposure with **ALL** of the following:
 - Core body temperature $> 100.5^{\circ}\text{F}$ or 38°C and $<104^{\circ}\text{F}$ or 40°C (or evidence of elevated core body temperature if cooling was initiated in the field) and
 - Short-term physical collapse or debilitation occurring during or shortly after physical exertion that rapidly resolves with minimal cooling intervention and
 - No evidence of CNS dysfunction or only minor CNS symptoms (e.g. headache, dizziness) that rapidly resolves with minimal cooling intervention.

RME Heat Exhaustion is combination of AR40-501 Heat Exhaustion + Heat Injury

$$HE_{RME} = HE_{AR40-501} + HI_{AR40-501}$$

2017 Armed Forces Reportable Medical Events Guidelines and Case Definitions

Heat Stroke Clinical Description

- Heat stroke (HS) is defined as an elevated core body temperature associated with central nervous system (CNS) dysfunction. Clinically, HS presents as hyperthermia, physical collapse or debilitation, and encephalopathy as evidenced by a change in mental status, delirium, stupor, or coma, occurring during or immediately following exertion or significant heat exposure. HS may be complicated by organ and/or tissue damage, systemic inflammatory activation, and disseminated intravascular coagulation. Heat stroke will likely be the working diagnosis for any service member with altered mental status and exposure history consistent with heat illness.

Heat Stroke Case Classification:

- Probable:
- A case that meets the clinical description of HS as described above occurring during/immediately after exertion or heat exposure with **ALL** of the following:
 - Evidence of elevated core body temperature (even if cooling was initiated in the field) and
 - CNS dysfunction (change in mental status, delirium, stupor, loss of consciousness or coma)
- Confirmed:
- A case that meets the clinical description as described above occurring during/immediately after exertion or heat exposure with **ALL** of the following:
 - Core body temperature $\geq 104^{\circ}\text{F}$ or 40°C and
 - CNS dysfunction (change in mental status, delirium, stupor, loss of consciousness or coma)

When reporting in DRSi, include:

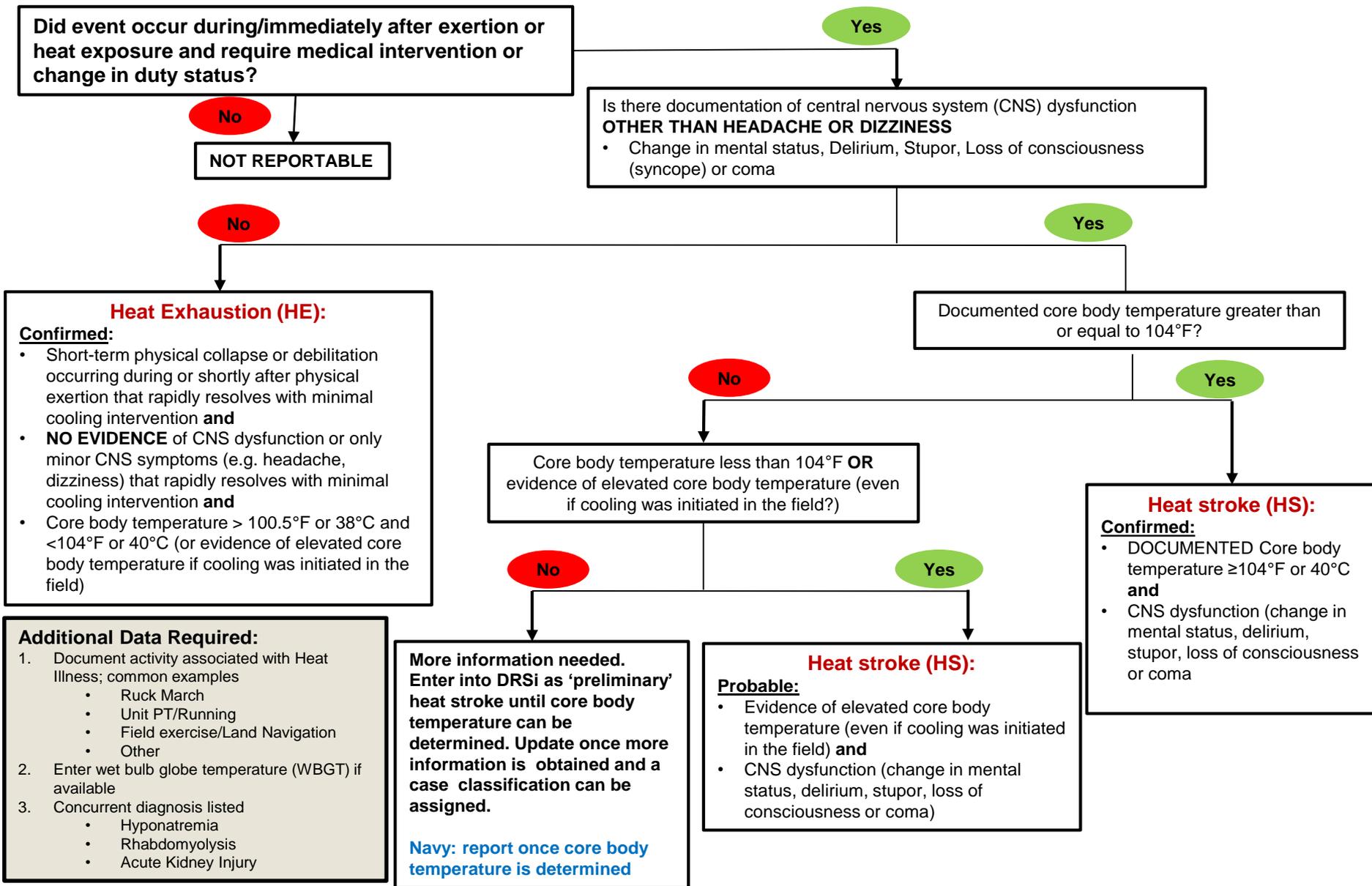
Critical Reporting Elements

- Specify the type of illness.
- Document the circumstances under which the case patient was exposed including duty exposure, occupational activities, environmental exposures, or other high risk activities.

Comments

- Please specify Wet Bulb Globe Temperature (WBGT) if known in degrees Fahrenheit.

- **Other conditions with similar presentation in similar environments**
 - Exercise Associated Hyponatremia
 - Exertional Rhabdomyolysis



Questions



Questions/Service POCs



- **Army: APHC – Disease Epidemiology Division**
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